

Translation

12-21-04  
PATENT COOPERATION TREATY

PCT/DE2003/00117



PCT

INTERNATIONAL PRELIMINARY EXAMINATION REPORT

511,855

(PCT Article 36 and Rule 70)

Applicant's or agent's file reference I0352WO/MGL	<b>FOR FURTHER ACTION</b> See Notification of Transmittal of International Preliminary Examination Report (Form PCT/IPEA/416)	
International application No. PCT/DE2003/001171	International filing date (day/month/year) 09 April 2003 (09.04.2003)	Priority date (day/month/year) 19 April 2002 (19.04.2002)
International Patent Classification (IPC) or national classification and IPC H01L 23/522		
Applicant INFINEON TECHNOLOGIES AG		

1. This international preliminary examination report has been prepared by this International Preliminary Examining Authority and is transmitted to the applicant according to Article 36.
2. This REPORT consists of a total of <u>5</u> sheets, including this cover sheet.  <input checked="" type="checkbox"/> This report is also accompanied by ANNEXES, i.e., sheets of the description, claims and/or drawings which have been amended and are the basis for this report and/or sheets containing rectifications made before this Authority (see Rule 70.16 and Section 607 of the Administrative Instructions under the PCT).  These annexes consist of a total of <u>3</u> sheets.
3. This report contains indications relating to the following items:  I <input checked="" type="checkbox"/> Basis of the report II <input type="checkbox"/> Priority III <input type="checkbox"/> Non-establishment of opinion with regard to novelty, inventive step and industrial applicability IV <input type="checkbox"/> Lack of unity of invention V <input checked="" type="checkbox"/> Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement VI <input type="checkbox"/> Certain documents cited VII <input type="checkbox"/> Certain defects in the international application VIII <input type="checkbox"/> Certain observations on the international application

Date of submission of the demand 20 October 2003 (20.10.2003)	Date of completion of this report 08 October 2004 (08.10.2004)
Name and mailing address of the IPEA/EP  Facsimile No.	Authorized officer  Telephone No.

# INTERNATIONAL PRELIMINARY EXAMINATION REPORT

International application No.

PCT/DE2003/001171

## I. Basis of the report

1. This report has been drawn on the basis of *(Replacement sheets which have been furnished to the receiving Office in response to an invitation under Article 14 are referred to in this report as "originally filed" and are not annexed to the report since they do not contain amendments.)*:

☐ the international application as originally filed.

☒ the description, pages 1-12, as originally filed,  
pages \_\_\_\_\_, filed with the demand,  
pages \_\_\_\_\_, filed with the letter of \_\_\_\_\_,  
pages \_\_\_\_\_, filed with the letter of \_\_\_\_\_.

☒ the claims, Nos. \_\_\_\_\_, as originally filed,  
Nos. \_\_\_\_\_, as amended under Article 19,  
Nos. \_\_\_\_\_, filed with the demand,  
Nos. 1-8, filed with the letter of 24 September 2004 (24.09.2004),  
Nos. \_\_\_\_\_, filed with the letter of \_\_\_\_\_.

☒ the drawings, sheets/fig 1/3-3/3, as originally filed,  
sheets/fig \_\_\_\_\_, filed with the demand,  
sheets/fig \_\_\_\_\_, filed with the letter of \_\_\_\_\_,  
sheets/fig \_\_\_\_\_, filed with the letter of \_\_\_\_\_.

2. The amendments have resulted in the cancellation of:

☐ the description, pages \_\_\_\_\_

☐ the claims, Nos. \_\_\_\_\_

☐ the drawings, sheets/fig \_\_\_\_\_

3. ☐ This report has been established as if (some of) the amendments had not been made, since they have been considered to go beyond the disclosure as filed, as indicated in the Supplemental Box (Rule 70.2(c)).

4. Additional observations, if necessary:

## INTERNATIONAL PRELIMINARY EXAMINATION REPORT

International application No.

PCT/DE 03/01171

## V. Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement

## 1. Statement

Novelty (N)	Claims	1-8	YES
	Claims	-	NO
Inventive step (IS)	Claims	1-8	YES
	Claims	-	NO
Industrial applicability (IA)	Claims	1-8	YES
	Claims	-	NO

## 2. Citations and explanations

## 1. Reference is made to the following documents:

D1: APARICIO R ET AL: 'Capacity limits and matching properties of integrated capacitors' PROCEEDINGS OF THE IEEE 2001 CUSTOM INTEGRATED CIRCUITS CONFERENCE, SAN DIEGO, CA, USA, 6-9 MAY 2001, Vol. 37, No. 3, pages 384-393, IEEE Journal of Solid-State Circuits, March 2002, IEEE, USA

D2: DE-A1-100 19 839 (MURATA MFG. CO. LTD.)  
21 June 2001.

## 2. Document D1 discloses (the references in parentheses are to D1):

a capacitor structure provided with a latticed region (vertical unhatched regions in the right-hand component figure of figure 9b and, in the left-hand component figure, the upper halves of the unhatched lattice in the right-hand component figure) which extends in a plane parallel to the substrate surface and in the recesses of which additional electrically conductive regions are located (figure 9b). That metallic region has surfaces which delimit it above and below in each of its partial regions. It would appear from the intended use in a semiconductor component that the latticed region and the conductive regions in the recesses

thereof are each connected to a connecting lead and must be separated from one another by means of insulating layers.

2.1 The subject matter of claim 1 differs from that capacitor structure in that said metallic region is *continuous in said plane*. (The vertical unhatched regions in the right-hand component figure of figure 9b and, in the left-hand component figure, the upper halves of the unhatched lattice in the right-hand component figure form parallel lattice rods which are connected to one another but not in the plane in which the lattice rods are located.) The subject matter of claim 1 is therefore novel in relation to D1.

2.2 Since said latticed region, including the metallic regions located in the recesses thereof, lies in a plane, fewer process steps are necessary in order to produce it: at least three planes have to be structured to produce a structure as per D1, but only two to produce the structure claimed in the present application. This simplified process engineering is not suggested by the prior art. The subject matter of claim 1 is therefore inventive.

3. Document D2 discloses (the references in parentheses are to D2) a capacitor structure provided with a latticed metallic region (14, figure 1A) which extends in a plane parallel to the substrate surface and in the recesses of which electrically conductive regions are located (21, figure 1A).

3.1 The subject matter of claim 1 differs from that capacitor structure in that the electrically conductive regions in the recesses are metallic plates or nodes. The subject matter of claim 1 is therefore novel in relation to D2.

3.2 As a result of this difference, the capacitance of the structure is increased. This is not suggested by D1, because D1 addresses a different problem (namely,

INTERNATIONAL PRELIMINARY EXAMINATION REPORT

International application No.  
PCT/DE 03/01171

minimization of the inductance). The subject matter of claim 1 is therefore also inventive.

4. Claims 2-8, being dependent claims, are likewise novel and inventive.